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NASA SimLabs News

Newsletter

Volume 7, Issue 4

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Welcome New Subscribers!

If you are receiving this newsletter for the first time, SimLabs News is a quarterly publication reviewing current projects at the NASA Ames Simulation Laboratories (SimLabs). NASA SimLabs is comprised of three unique Flight Simulators, an Air Traffic Control radar simulator and a high fidelity Air Traffic Control Tower simulator. The facilities support government as well as private industry in a wide array of applications. To find out more, read on!

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1. FutureFlight Central Provides Virtual Presence for Analog Mission Studies

Many technological advances will be needed to develop the first lunar outpost. One important need is to have an efficient way to survey lunar sites for civil engineering, geophysical and resource prospecting purposes. Robots supervised by humans will assist in tedious tasks such as terrain and subsurface mapping.

In a July 2007 field test, SimLabs' [FutureFlight Central](#) supported the [Intelligent Robotics Group](#) at NASA Ames in a lunar analog mission at the Haughton Crater in the Canadian high arctic. The purpose was to develop operational procedures and software systems for performing systematic, comprehensive site survey. Haughton is a premier lunar and Mars analog site, because of its size, isolation, and topography.

Remote operation is very cost effective and improves mission productivity because it integrates more technical expertise without the risk and cost of physically supporting the additional people in the field.



Figure 1. Scientists conduct robotic ground operations remotely in FutureFlight Central

SimLabs' FutureFlight Central was configured for live ground operations for the mission. The large screens enable shared viewing of several telemetry-driven applications and their corresponding displays. One display allowed visualization of the data from ground penetrating equipment carried by one of the robots. Another display showed the lidar or scanning laser rangefinder data for 3D terrain modeling. A Google Earth map monitored planned vs. actual rover trajectories, and a robot-mounted camera provided live video from the field.

Video conferencing with the base camp enabled local and remote teams to collaborate in real-time. Ames Center Director, Pete Worden, was on hand at the remote site and conversed with mission operators in FutureFlight Central. [More photos.](#)

Future plans include configuring FutureFlight' Central's 360 degree visualization for an immersive 3D view of land and underwater terrain.

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2. Crew Procedures for Trajectory-Based Negotiations

Researchers at NASA Ames continue to study automation of cockpit operations as a way to assist pilots in moving aircraft more safely and efficiently through today's airspace, while looking forward to future requirements and capabilities. A series of studies are being conducted in the [B747-400 Flight Simulator](#) at SimLabs' [Crew-Vehicle Systems Research Facility \(CVSRF\)](#) for Trajectory-Based solutions to aircraft conflict resolution.



Figure 2. B747-400 Simulator
Flight Management System

Automated systems on the ground monitor all traffic and when conflicts are identified, compute a 4D (3D + time) resolution to the problem. This latest study looked at how to get this information to the pilots with clarity and expedience. The study proposed possible adaptation of Future Air Navigation System (FANS), used for over a decade on over-water flight operations, to domestic operations in US airspace. FANS datalinks flight plan modifications directly to aircraft on-board Flight Management Systems (FMS).

This latest research investigated crew procedures that could be utilized to integrate FANS into an even more dynamic system, i.e. a system in which pilots access and review 4D clearances, then either accept or reject the clearance, all without use of radio frequencies. This concept research is a precursor to a more in-depth study scheduled for spring of 2008.

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3.Upcoming Conferences

Simlabs will have representatives at these upcoming conferences.

[52nd Annual Air Traffic Control Association \(ATCA\) Conference and Exposition](#)
Washington, D.C.
October 27-31, 2007

[American Association of Airport Executives \(AAAE\) Runway Safety Summit](#)
Milpitas, California
November 14-16, 2007

[Interservice/Industry Training, Simulation and Education Conference \(I/ITSEC\)](#)
Orlando, Florida
November 26-29, 2007

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4. Thinking of Doing Business with NASA SimLabs?

For more information on what we can do for your needs, contact:

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